



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/935,522	08/23/2001	Yuichi Yamamoto	70868-56306	9099

21874 7590 08/12/2003

EDWARDS & ANGELL, LLP
P.O. BOX 9169
BOSTON, MA 02209

EXAMINER

WINTER, GENTLE E

ART UNIT

PAPER NUMBER

1746

DATE MAILED: 08/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/935,522	Applicant(s) YAMAMOTO, YUICHI	
	Examiner Gentle E. Winter	Art Unit 1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) 9 and 10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 11-18 is/are rejected.
- 7) ☒ Claim(s) 5, 7, 15 and 17 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Election/Restrictions

1. Claims 9 and 10 are withdrawn pending allowance of claim 1.

Claim Objections—Maintained and New

2. Claims 5 and 7 were and are objected to under 37 CFR 1.75(c), as being of improper dependent form.

3. In response applicant argued:

[S]olely to expedite allowance of this application, Applicant has amended both of these claims. In view of at least these amendments and/or remarks, the objections to claims 5 and 7 are either believed to have been overcome or to have been demonstrated inappropriate.

4. The arguments have been carefully considered but fail to overcome the objection. It is not clear how the amendments overcome the objections, nor is it clear how the objection has been demonstrated inappropriate.

5. The objection is repeated below:

6. Claims 5 and 7 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Specifically, the recitation of internal pressure of the enclosed space is higher than the pressure of the cleaning solution, which is supplied to the nozzle and is ejected therefrom; does appear to add any structure. The recitation of the

Art Unit: 1746

operational frequency, without some accompanying structural limitation, or statement of structural dissimilarity, does not structurally differentiate the claim. As such claims 5 and 7 are rejected with their base claim. Claims 15 and 17 are similarly objected to.

Claim Rejections - 35 USC § 102—Maintained

7. Claims 1-4, and 8 were and are rejected under 35 U.S.C. 102(b) as being anticipated by United States Patent No. 4,890,567 to Caduff. Claims 5 and 7, because they fail to further limit the claims from which they depend, are rejected with their base claim. Any confusion on this point is regretted.

8. With respect to the art rejection of claim 1 applicant argued:

[T]he Caduff patent...does not appear to disclose or suggest any noticeable, let alone specific pattern of arrangement of the four ultrasonic transducers (58) depicted in its Figures 3 and 4 thereof. ...It appears as though the heads are substantially aligned with each other. This is in stark contrast to the staggered configuration of the plural ultrasonic vibration units of claim 1 in which a substantially center of a certain ultrasonic vibration unit of one row is located toward a space defined between two adjacent ultrasonic vibration units of the other row.

9. As an initial matter the term “staggered” does not appear to be present in the claim. It also noteworthy that the claim recitation: “toward a space defined between two adjacent ultrasonic vibration units of the other row” is NOT construed to mean: “IN a space defined between two adjacent ultrasonic vibration units of the other row”. In a larger sense, Caduff, when viewed at an angle would reveal a staggered orientation of the transducers. As such the arguments put forward, after careful consideration are not persuasive in distinguishing the instant claims from the prior art of record. The rejection is repeated below for Applicant’s convenience.

Art Unit: 1746

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-4, and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by United States Patent No. 4,890,567 to Caduff.
2. Claim 1 and 5 is drawn to an ultrasonic cleaning apparatus including a plurality of ultrasonic vibration units each having a nozzle, a vibration plate to which a vibrator is fixed; wherein the plural ultrasonic vibration units are arranged in two rows in a widthwise direction and also so arranged that a certain ultrasonic vibration unit of one row is located toward a substantially center of two adjacent ultrasonic vibration units of the other row.
3. Caduff discloses an ultrasonic cleaning apparatus (see title and the preamble of *inter alia* claim 1) including a plurality of ultrasonic vibration units (element 58 in figure 2-4 and described in detail in the associated text. Each transducer having a nozzle (element 52 and associated text), a vibration plate to which a vibrator is fixed. The vibration plate is construed to be the housing and is element 18 (or 10) from the drawing. The plural ultrasonic vibration units (58) are arranged in two rows in a widthwise direction (see figure 3 especially and associated text) and also arranged such that a certain ultrasonic vibration unit of one row (consider for example the center left row in figure 3) is located toward a substantially center of two adjacent ultrasonic vibration units of the other row. In this case consider the right hand center row. As there are only two rows, the offset is relative to the angle at which the system is viewed.

4. As to claim 2 disclosing that the ultrasonic vibration unit includes a holding member (this is construed to read on element 10 of Caduff in that the element supports the ultrasonic vibration unit, element 58) for holding the vibrator. The power supply for the vibrator 58 is disclosed at e.g. column 5, line 5 *et seq.* but is not in the figures. It is noted that the power supply is inherent. The casing 10 has an enclosed space portion formed therein for accommodating the vibrator 58. The nozzle with a predetermined dimensional width is disposed adjacent to the vibration plate, the nozzle 52 including a projection piece for supplying cleaning solution through which ultrasonic vibration is transmitted 58 to the vibration plate 12.

5. As to claim 3, disclosing that the casing includes a cleaning solution supply path for supplying cleaning solution to the nozzle (the solution is shown ejected from the nozzle 52, inherently the solution is supplied to the nozzle) an air supply path for supplying air to the enclosed space portion 40 and associated text. Further, line 40 includes a wire-laying path for laying down the wire required to supply the power to the vibrator 58.

6. As to claim 4, disclosing that each of the ultrasonic vibration units, the casing (18) is provided with an opening portion for providing communication among the enclosed space portion (shown in figure 4 as the area where the nozzle is located), the air supply path (40) and the wire-laying path (40).

Art Unit: 1746

7. As to claim 8, disclosing that the opening portions of the end nozzles are arranged in the widthwise direction are located so that the target material (ship's hull) to be cleaned is interposed between the both nozzles, as viewed in the carrying direction. See figure 3. In a larger sense this limitation is seemingly drawn to a future intended use. Future intended uses are given weight that to the extent that they impact structural components.

Claim Rejections - 35 USC § 103—Maintained

8. Claim 6 was rejected under 35 U.S.C. 103(a) as being unpatentable over Caduff as described above and United States Patent No. 5,399,017 to Droege, and Claim 7 rejected under 35 U.S.C. 103(a) as being unpatentable over Caduff as described above and United States Patent No. 4,368,054 to Koretsky et al. In response Applicant argued:

[A]ssuming - for the of argument herein – that either of these references may be properly combined with the Caduff patent, neither the Droege patent [nor] the Koretsky patent is believed to provide any additional disclosure or suggestion that would support the rejection of either pending claims 1 or 11.

9. Applicant's arguments with respect to claim 1 are accepted. As to claim 11, since it was not rejected using either reference the arguments do not address a pending rejection. However, to the extent that claim 1 mirrors claim 11, the position is not argued. Claim 1 was anticipated and the additional references were not applied to claim 1, as such the rejection stands for the reasons indicated above.

The rejection is repeated here for Applicant's convenience.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 1746

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claim 6 rejected under 35 U.S.C. 103(a) as being unpatentable over Caduff as described above and United States Patent No. 5,399,017 to Droege.

11. Specifically, claim 6 discloses that each of the ultrasonic vibration units (58), the vibrator and the power supply member (construed as the power source) are fastened to the casing constituting the enclosed space portion by screws. Each and every claim limitation of claim 6 is identically disclosed in Caduff, as set forth above, except using a screw fastening system. While this is believed to be either inherent or obvious to be rigorous, Droege discloses screws are good fasteners. See e.g. column 10, line 35 *et seq.* disclosing that the spring support 38 will be attached to box 12 with some type of fastener such as a screw, a bolt, or some other fastener.

12. Claim 7 rejected under 35 U.S.C. 103(a) as being unpatentable over Caduff as described above and United States Patent No. 4,368,054 to Koretsky et al.

13. In the event that structural differences are found to exist with respect to claim 7, then the limitations found in claim 7, specifically, ultrasonic vibration in use has a frequency within a range of 400 kHz to 2 MHz would apparently differentiate the claim from the explicit teaching of Caduff. The disclosed frequency is not identically disclosed in Caduff but is believed to be inherently. Koretsky discloses a range of between 100 kHz and 100 MHz. See e.g. column 4, line 26 *et seq.* especially at line 41. The artisan would have been motivated to take the value

Art Unit: 1746

explicitly disclosed in Koretsky because it is within the commonly disclosed range and is consistent with ultrasonic cleaning system applications.

14.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-8 and 11-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent publication 09-192618 ('618) drawn to an ultrasonic washer and United States Patent No. 3,640,295 to Peterson (Peterson).

3. As was noted above claims 5, 7, 15, and 17 are objected to because they do not add any structure to the base claims from which they depend. In analyzing the limitations in 5 and 15 it appears to be clear that the apparatus could function as disclosed without any additional structural limitations. That said the '618 reference discloses (per the electronic translation that this examiner procured from the JPO website) that the closed space which "holds the aforementioned piezoelectric device and the aforementioned electric supply member in the aforementioned washing nozzle is formed, and it is characterized by making the inside of this closed space into inert gas atmosphere or dried-air atmosphere." Seemingly, this disclosure mirrors that of the claim, however, this examiner is still not clear how this adds additional structure.

4. With respect to claim 7, and 17 it is not clear how the apparatus differs structurally with the addition of the limitation that the high frequency power supplied to the vibrator is within a range of 400 kHz to 2 MHz. Again it is not clear what structural limitation is being claimed, other than the capacity to perform in the indicated manner. In any case the '618 patent discloses "the electric supply member...supplies electric power to the aforementioned piezoelectric device in high-frequency voltage". High frequency would inherently include values within 0.4-2 MHz.

5. As to claims 1 and 11 and the '618 reference discloses an ultrasonic cleaning apparatus in which ultrasonic vibration is applied to at least part of cleaning solution (see figure 1 and relevant associated text of '618), and, by a piece-by-piece method (shown as wafers), a material to be cleaned is cleaned with the cleaning solution while being carried in a predetermined direction (via the belt 2), the ultrasonic cleaning apparatus comprising an ultrasonic vibration unit (figure 1 and relevant associated text) having a nozzle (washing nozzle 3) elongated in one direction, for spraying cleaning solution from the nozzle to the material to be cleaned, the cleaning solution being applied with ultrasonic vibration by a vibration plate to which a vibrator is fixed so as to pair up therewith.

6. Each and every limitation of claims 1 and 11 is disclosed in the '618 reference as set forth above, except that '618 fails to explicitly disclose that a plurality of ultrasonic vibration units are arranged in two rows in a widthwise direction orthogonal to the carrying direction, and

Art Unit: 1746

also so arranged that at least one end of a certain ultrasonic vibration unit of one row is located toward a substantially center on an ultrasonic vibration unit of the other row.

7. Peterson identically discloses the missing elements and explicitly provides the motivation for making the instant combination. Specifically referring to FIG. 1, Peterson discloses an ultrasonic cleaner 10. The cleaner 10 includes a cavity portion 13 divided into two sinks, 14 and 15. Sink 14 contains a plurality of ultrasonic transducers 16 arranged along its bottom and sides. The arrangement of the ultrasonic transducers 16, is essentially staggered with respect to one another. The artisan would have been motivated to make the combination for the reason explicitly set forth by Peterson, namely, to minimize, as much as possible, the amount or degree of cancellation of interfering ultrasonic waves emitted from the various transducers 16. In a larger sense, staggering the transducers may be done for other reasons, such as a more efficient electrode placement scheme.

8. With specific respect to claims 2 and 12, disclosing that the ultrasonic vibration unit (figure 1 of the '618 reference) includes a holding member (element 23 figure 2) for holding the vibrator (piezoelectric 14/14a); a power supply member (electric supply member, 15) for supplying a high frequency power to the vibrator (piezoelectric 14/14a) by making elastic contact with an electrode of the vibrator and the holding member; a wire for supplying the power to the power supply member; and a casing (element 3 of figure 1) having an enclosed space portion formed therein for accommodating the vibrator (piezoelectric 14/14a), the power supply member (electric supply member, 15), and the wire, and wherein the nozzle (washing nozzle 3)

Art Unit: 1746

with a predetermined dimensional width is disposed adjacent to the vibration plate (14/14a), the nozzle including a projection piece (washing nozzle 7) for supplying cleaning solution through which ultrasonic vibration is transmitted to the vibration plate and for convectively circulating the cleaning solution. It is noted that little patentable weight is accorded future intended use that does not include some structural limitation. Rather structural limitations are where the vast majority of patentable weight resides.

9. With specific respect to claims 3 and 13 disclosing that the ultrasonic cleaning apparatus of claim 2, wherein, in each of the ultrasonic vibration units arranged, the casing (element 3 of figure 1) include a cleaning solution supply path for supplying cleaning solution to the nozzle (washing nozzle 7) an air supply path (29 supplied air nozzle) for supplying air to the enclosed space portion and a wire-laying path for laying down the wire required to supply the power to the vibrator (14).

10. As to claims 4 and 14, further limiting claims 3 and 13 respectively and disclosing that in each of the ultrasonic vibration units (14/14a), the casing (element 3 of figure 1) is provided with an opening portion for providing communication among the enclosed space portion, the air supply path (29 supplied air nozzle), and the wire-laying path. Inherently an enclosed space will support a pressurized fluid.

11. As to claim 6, further limiting claim 2 and disclosing that in each of the ultrasonic vibration units (14/14a), the vibrator and the power supply member (electric supply member 15)

Art Unit: 1746

are fastened to the casing constituting the enclosed space portion, by screws (the same is indicated by element 28 in figure 1).

12. As to claim 8 and 18, disclosing that the opening portions of both end nozzles (14/14a) arranged in the widthwise direction are located so that the target material to be cleaned is interposed between the both nozzles, as viewed in the carrying direction. As indicated above, future intended use without structural limitation is accorded minimal patentable weight. Since the size of the object being cleaned is not claimed in this claim, a small size object would readily be interposed between both nozzles, as viewed in the carrying direction.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Art Unit: 1746

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gentle E. Winter whose telephone number is (703) 305-3403.

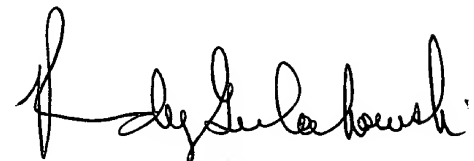
The examiner can normally be reached on Monday-Friday 7:00-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy P. Gulakowski can be reached on (703) 308-4333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications. The direct fax number for this examiner is (703) 746-7746.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Gentle E. Winter
Examiner
Art Unit 1746

August 4, 2003



RANDY GULAKOWSKI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700